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Western Balkans Investment Framework Infrastructure Project Facility Technical Assistance 8 (IPF 8)

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WB19-SRB-TRA-03

Orient/East-Med Corridor: Serbia–North Macedonia Corridor X Rail Interconnection, Niš–Preševo–Border Between the Two States Section

SCOPING REPORT – NON-TECHNICAL SUMMARY

(Final version)

May 2023

*) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence

COWI | IPF

Western Balkans Investment Framework (WBIF)

Infrastructure Project Facility Technical Assistance 8 (IPF 8)

Infrastructures: Energy, Environment, Social, Transport and Digital Economy

TA2018148 R0 IPA

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SCOPING REPORT – NON-TECHNICAL SUMMARY

May 2023 (final version)

The Infrastructure Project Facility (IPF) is a technical assistance instrument of the Western Balkans Investment Framework (WBIF) which is a joint initiative of the European Union, International Financial institutions, bilateral donors and the governments of the Western Balkans which supports socio-economic development and EU accession across the Western Balkans through the provision of finance and technical assistance for strategic infrastructure investments. This technical assistance operation is financed with EU funds.

Disclaimer: *The authors take full responsibility for the contents of this report. The opinions expressed do not necessarily reflect the view of the European Union or the European Investment Bank.*

PROJECT NO.	DOCUMENT NO.				
WB19-SRB-TRA-03	WB19-SRB-TRA-03_Scoping Report - NTS				
VERSION	DATE OF ISSUE	DESCRIPTION	PREPARED	CHECKED	APPROVED
1	15/04/2023	Version 1	RR/AAM/MVM/TB	RT	MJ
2	17/05/2023	Version 2 (final)	RR/AAM/MVM/TB	RT	MJ

CONTENTS

List of abbreviations

CITES	Convention on International Trade in Endangered Species
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EIA	Environmental Impact Assessment
EIB	European Investment Bank
ERTMS	European Rail Traffic Management System
E&S	Environmental and Social
ESIA	Environmental and Social Impact Assessment
ESS	EIB Environmental and Social Standards (2 February 2022)
ESMP	Environmental and Social Management Plan
EU	European Union
GHG	Greenhouse gas
IFI	International Financing Institution
ILO	International Labour Organization
MCA	Multi Criterial Analysis
NPAA	National Programme for the Adoption of the Acquis
OHS	Occupational Health and Safety
RAP	Resettlement Action Plan
SEP	Stakeholder Engagement Plan
SRI	Serbian Railways Infrastructure
TEN-T	Trans-European Transport Network
ToR	Terms of Reference
UNESCO	United Nations Educational, Scientific and Cultural Organization

Synopsis

Project Title	Orient/East-Med Corridor: Serbia - North Macedonia CX Rail Interconnection, Niš - Preševo - Border Between the Two States Section
Subproject number	WB19-SRB-TRA-03
Contracting authority	European Investment Bank (EIB)
TA Consultant	IPF8 - COWI |IPF
Main Beneficiary	Ministry of Construction, Transport and Infrastructure of Serbia
Subproject area	Niš – Preševo – Border of Serbia with North Macedonia
Lead International Financing Institution	European Investment Bank (EIB)
Subproject Starting Date	22 June 2020
Subproject Duration	24 months, as indicated in the ToR , 60 months for both IPF8 and IPF11,

Introduction

The project focuses on the preparation of the Preliminary Design and Feasibility Study for the Reconstruction and modernization of the railway line Niš - Preševo. The modernized railway line should meet the requirements defined by the international agreements. The reconstructed and modernized railway for mixed passengers and freight traffic should be equipped with modern ERTMS devices and other characteristics in accordance with the requirements of interoperability.

The reconstruction and modernization of the line are defined as a priority for the future development of the Serbian railway network, due to the high importance of the railway line, as well as its low technical characteristics which affect regular passenger and freight transport.

Under the scope of this study, and in compliance with the environmental and social requirements of the IFIs, a brief scoping report, ESIA, Resettlement Action Plan (RAP) and Stakeholder Engagement Plan (SEP) will be prepared. These reports will be prepared guided by and in compliance with the EIB Environmental and Social Standards (ESS).

The analytical description of the baseline and of the impacts and mitigation measures are described in the Scoping Report. These will be further detailed at the ESIA main stage. The Stakeholder Engagement process is planned as an iterative process, comprehensive and commensurate to the risks, impacts and level of interest of the stakeholders identified in the coming phases of the project.

Legal framework

Operations and activities for which potential financing from the European Investment Bank (EIB) is sought fall under the application of their respective applicable Environmental and Social Standards.

The EIB Environmental and Social Standards from February 2022 provide an operational translation of the policies and principles contained in the 2022 EIB Statement of Environmental and Social Principles and Standards. They are grouped across 11 thematic areas covering the full scope of environmental, climate and social impacts and issues.

The project will comply with Serbian national requirements including applicable EU Laws and Directives.

Serbian Context

The Serbian legislative framework will be applied for the environmental and social aspects of the project such as Environmental Protection, Water, Waste, Nature Protection, Noise Protection, Air Quality and Cultural Heritage, Safety and Health, Labour Relations, Employment, Social Protection, Property and Expropriation as supplemented to meet the requirements of EIB.

The Environmental Impact Assessment procedure in the Republic of Serbia as governed by the Law on Environmental Impact Assessment is harmonized with the

European EIA Directive (85/337/EEC, 97/11/EC, 2003/35/EC and COM 2009/378 as codified by the Directive 2011/92/EU and as amended by the Directive 2014/52/EU).

The EIA Law defines the procedures of impact assessment for the activities that may have significant effects on the environment, the contents of the Environmental Impact Assessment (EIA) Study, the required engagement of authorities and organizations concerned, citizen engagement, trans boundary exchange of information for projects that may have trans boundary impacts, supervision, and other issues of relevance to impact assessment.

Impact assessment is carried out for the future projects and those under implementation, changes in technology, reconstruction, capacity enhancement, closure, and decommissioning activities and for removal of projects that may have significant impact on the environment.

The EIA is applicable to the industry, mining, energy production, transport, tourism, agriculture, forestry, water management, waste management and utility services sectors, as well as for all the projects that are planned in areas of protected natural resources of special value and within the protected zones of immobile cultural resources.

The Decree on Determining the List of Projects for which an Impact Assessment is mandatory and the list of projects for which an Environmental Impact Assessment may be Required ("Official Gazette of the RS", No. 114/08) determines the List I Projects (for which an Environmental Impact Assessment is mandatory) and List II Projects (for which an environmental impact assessment may be required). According to its characteristics, the project in question is classified in List I, under item 7. Construction of: 1) Main railway lines including ancillary facilities (bridges and stations).

International legislative framework

The most relevant Directive is the Directive 2011/92/EC amended by Directive 2014/52/EU. According to the Directive, the proposed Subproject falls into Annex I, Category 7 (a) "Construction of lines for long-distance railway traffic and of airports with a basic runway length of 2100 m or more".

The project is aligned with the requirements deriving from EU Directives (Water Framework Directive, Floods Directive, Groundwater Directive etc.) international agreements and conventions related to environmental and social issues such as the Bern, CITES, ESPOO, ILO, UNESCO conventions etc.

Serbia adopted a third revised version of the National Programme for the Adoption of the Acquis of the European Union (NPAA). NPAA is the most significant and most comprehensive document in the process of European integration of Serbia, since in addition to harmonising the complete domestic legislation with the EU acquis, it also requires the strengthening of administrative capacities during accession negotiations with the EU, as well as long-term financial planning and responsible budget planning.

The Project proposal falls under category "High" of the EIB (those for which an EIA is mandatory (Annex 1 of the Directive).

Project description

Existing state of the railway

The single-track railway line Niš-Preševo-state border railway line is approximately 157 km long.

This section forms part of Pan-European Corridor X that passes through Austria, Slovenia, Croatia, Serbia, North Macedonia, and Greece.

Generally, the line passes along flat topography, apart from a central section of 32 km between Grdelica and Suva Morava. Here the topography is mountainous, and the line shares a corridor within a river canyon with other major road infrastructure, including the Corridor 10 motorway.

The railway section included in the scope of this sub-project can be divided into three subsections considering distinct terrain conditions, as follows:

Subsection A: Brestovac – Grdelica

The length of Subsection A is about 34 km.

The minimum radius of the horizontal curves is 400 m, before the Grdelica station, where the maximum speed (Vmax) is reduced to 90 km/h. On the rest of the section parameters of horizontal geometry allow speed of 120km/h.

Subsection B: Grdelica – Vladicin Han

The length of Subsection B is about 32 km. The minimum radius of the horizontal curves is 300 m, where the possible speed is Vmax = 80km/h.

Subsection C: Vladicin Han - State border with North Macedonia (Tabanovce)

The length of Subsection C is about 67 km. The minimum radius of the horizontal curves is 300 m, where the possible speed is Vmax = 80 km/h. However, the majority of curves have radii of over 700 m (60% of the total number of horizontal curves), which corresponds to Vmax of 120 km/h.

Throughout the section, the permissible axle load is 225 KN, and permissible load per linear metre 80 KN/m. The key structures along the line are three tunnels (less than 500 m long) and 14 bridges with spans larger than 30 m.

The stations are not well equipped for passenger operations and do not offer sufficient comfort and safety to the passengers.

Originally constructed to a design speed of 120km/h the line has deteriorated to such an extent that operating speeds have been severely reduced in certain sections.

The following sections of the line were rehabilitated during 2017, with the funding of a Russian loan:

- Vinarce–Djordjevo, in Subsection 1 (13.8 km)
- Vranjska Banja–Ristovac, in Subsection 3 (17.7 km), and
- Bujanovac–Bukarevac (12.9 km), also in Subsection 3.

These works included some minimum technical improvements to restore the design speeds, but the operating speeds in these subsections still do not exceed 90-100 km/h. No civil structures (bridges, culverts, or tunnels) were included in those works.

Planned works

Solutions are defined for the following:

- the route of the single-track railway and stations,
- objects on the railway: bridges, underpasses, overpasses, culverts
- hydrotechnical facilities
- architectural structures
- de-levelled crossings with roads.

Optimised option starts in Brestovac station at Km 267+942, and ends at the border with North Macedonia (Tabanovce) at Km 396+325.

Technical elements:

- alignment length: 130.87 km,
- air distance of start/end point of the alignment: 103.03 km,
- number of horizontal curves: 113,
- minimum radius of horizontal curves (Rmin) = 300m,
- total curve length: 50,641.34 m or 38.69 %,
- total straight length: 85,233.62 m or 61.31%,
- maximum gradient: 11.58‰ along 5,957.66 m,
- average radius of horizontal curves: 760.85 m,
- curvature coefficient of alignment: 24.37°/km,
- curvature factor: 130.87/103.03 = 1.27,
- total length of bridges: 2.42 km (1.85% of total alignment length), longest bridge is 120 m,
- total length of tunnels: 1.69 km (1.29% of total alignment length), longest tunnel 591 m (on subsection 3, new tunnel),
- the number of tunnels on subsection 2 will remain as now and Letovica tunnel will be on a new alignment:
  - Tunnel Grdelica – 170.27 m,
  - Tunnel Letovica – 526.77 m,
  - Tunnel Hanski - 402.4 m.
  - Construction of a new tunnel on subsection 3: - 591 m.
- the total length of open alignment: 126.76 km (96,86% of the total alignment length),

- all stations and passing points that still exist today, will be retained in operational condition, except Vinarci passing points (leaving 9 stations and 8 passing points).

Key elements of the environmental and social baseline

This section describes the main components of the physical and natural baseline environment in the area affected by the implementation of the proposed Project. The characterization of the existing environment and identification of sensitivities along the proposed railway alignment have involved a comprehensive desk review of a wide range of existing data sources and desk studies.

Environmental baseline

The climate in the project area is continental to moderate-continental, and the amount of precipitation is usually up to 500-600 mm/year, while the air humidity is moderate. It is characterized by relatively colder winters, warmer autumns than spring and moderately warm summers. More specifically, low annual precipitation dominates, while the summer precipitation is characterized by strong evaporation due to high temperatures, with frequent occurrence of summer storms and showers. Winds are a very important factor causing differences in temperature, bringing precipitation or drought. Although the wind frequency is high especially in this area, its speed is low.

Landscape characteristics of topographical units that include the analysed corridor are an important element for understanding the overall relationship between the planned object and the environment. The analysis of the terrain established that the sections are provided through areas with different landscape and visual characteristics, which make up:

- The valley of the Južna Morava and the hills on the left bank of the Južna Morava; Grdelica gorge; the Južna Morava valley;
- Contact of hills and plain terrain which is mainly anthropogenically altered arable land;
- Constructed parts of the route where it passes through populated areas (Brestovac, Lipovica, Pečenjevce, Leskovac, Vladičin Han, Vranjska Banja, Vranje, Bujanovac, Preševo) including the E-75 (A1) highway corridor; and other infrastructure facilities.

Throughout the research area, formations of different geological ages are represented. These are the old Proterozoic sediments, the mesozoic sediments, the neogene sediments (these are dacites, andesites and quartzlates, while Miocene deposits are characteristic of this area) and the Quaternary sediments.

In order to determine the seismicity of the terrain, maps of the Republic Seismological Institute of Serbia. The observed area is in the zone of seventh-eighth degree and eighth degrees of seismic scale MSC. The route of the existing line is in the zone of seven-eight degrees of seismic scale.

In the area through which the railway passes, classes of fluvial and fluviogleic soils are characteristic, with azonal soil types standing out, differently developed and differently fertile. The main soil types are: alluvium, alluvium in cultivation, alluvial meadow land. Due to the great erosion in its basin, Juzna Morava is rich in large amount of material that settles in the riverbed.

Based on the map of waste disposal sites of the public utility company and illegal or old dumps, there are a certain number of illegal dumps along the railway line, according to the Environmental Protection Agency.

Potentially contaminated locations along the railway line are not currently known. These data will be further investigated in the subsequent stage of the Environmental Impact Assessment Study.

The network of stations for automatic air quality monitoring is, in accordance with the Law on Air Protection, recognized as a state network for air quality monitoring at the level of the Republic of Serbia. Taking into account the route of the railway, the relevant stations for automatic air quality monitoring are located in Niš and Vranje.

The nearest areas in which noise is measured are Niš, Leskovac and Vranje under the responsibility of the local Public Health Institutes. Taking into account their scarcity, as well as the distance of the railway line from the measuring stations, the data obtained from them cannot be considered as relevant for the preparation of the noise baseline.

The hydrographic network includes river Juzna Morava and its tributaries.

Based on the Decree on the categorization of watercourses (Official Gazette of the SRS, No. 5/68), the river Juzna Morava belongs to IIa and IIb subclasses of watercourses. Class II includes waters suitable for bathing, recreation and water sports, for the breeding of less noble species of fish (cyprinids), as well as waters which, in addition to normal treatment methods (coagulation, filtration and disinfection), can be used to supply water to beverages and in the food industry.

The most important groundwater aquifer is within the South Morava valley, where there are sands and gravels, river terrace gravels and proluvial deposits. Sensitive areas in respect to risk of groundwater pollution are Vranje, Leskovac and Bujanovac, whose protection zones are near or intersected by the railway, and several other lower public sources in the wider vicinity. Data about water sources near the route are from the Spatial plan of the special purpose area of the infrastructure corridor Nis-border of Bulgaria.

In respect to biodiversity, the Grdelica gorge is the area of the highest sensitivity along the corridor. Although it is not formally protected, the Grdelica area is a refugium for tertiary flora, rare and endangered herbal species and mixed relic vegetation (some in The Red Data Book of Flora of Serbia). Some endangered and protected birds of prey, such as the golden eagle (*Aquila chrysaetos*) and the peregrine falcon (*Falco peregrinus*) are also present in the Grdelica gorge. These two species were identified by the Institute for Nature Protection as highly sensitive, and it will be necessary to protect them from excessive anthropogenic impacts during construction and operation of the whole traffic corridor. Aside from the important species which reside there, the Grdelica gorge also represents a migratory route for

some fauna species, from the south to the north. There are no protected areas on the railway route.

Within the affected zone of the railway corridor, ecological corridor of Južna Morava River is identified. This corridor have international importance and present ecological pathway and connections that enable the movement of individuals of populations and the genes flow between protected areas and ecologically important areas, according to the Decree on ecological network According to Law on nature protection, Article 130, The ecological network will be established and become part of the European ecological network Natura 2000 by the day of the accession of the Republic of Serbia to the European Union. Ramsar sites and Emerald Areas are not identified within the area of influence.

Social baseline

Elements of the baseline have been chosen to depict the Project area's sensitivity in terms of potential adverse social impacts and the possibility that the intervention would create, reinforce or deepen inequity and/or social conflict, or that the attitudes and actions of key stakeholders may subvert the achievement of the development objective. The Social baseline has been created observing both *greenfield* and *brownfield* portions of the Project.

Serbia constitutes of 29 administrative districts which are not units of local self-governments but are established for purpose of state administration outside the headquarters of the state administration. Administrative districts are established by the RS Government decree, which also included the areas and seats of administrative districts. The railway route passes through Jablanicki and Pcinjski Districts.

Population censuses are the main source of statistical data on the total number, territorial distribution and major characteristics of individuals and households in the Republic of Serbia. The number of population is estimated in the inter-censual period for every year, including the census year. Thus, in 2019 the population of the Republic of Serbia is estimated to 6 945 235. In almost all municipalities through which the railway corridor passes, the decline in population will continue in the future.

Less than a half of the population of the Republic of Serbia is economically active (41.3%), whereby the share of male labour force (57.2%) prevails over the female (42.8%). The number of unemployed per thousand inhabitants was higher than the national average in all municipalities through which the railway corridor passes. All municipalities on the route had an average salary below the national average.

Education is a decisive factor for a person's economic status and ability to generate income, and it is therefore not surprising that lower-educated people are above average at risk of poverty. The highest at-risk-of-poverty rate in 2016 - 2018 period was in the population with primary education and lower than primary school (39.1%), and the lowest in the at-risk-of-poverty population with high school or university education (10.3%). The Poverty Risk Rate is higher than the national average.

Among immovable cultural properties there are 6 monuments of culture in the vicinity (400-700m) of the existing railway line. Impacts to cultural heritage and archaeological sites will be scoped in and will be analysed in details at the Level of ESIA.

Assessment of impacts to CH is constrained to the registered and known sites of tangible cultural heritage sites, while chance finds as per nature are not covered, and will be part of the mitigation strategy through the ESIA and ESMP. Emphasis in the next phase shall be given to impacts from access roads, borrow and deposit areas. In cases of suspected elevated risks, the ESIA shall prepare the Cultural Heritage Impact Assessment and a commensurate Cultural Heritage Management Plan to be developed as a self-standing document.

The Constitution of the Serbia proclaims principles of gender equality. Despite principles however, many women in Serbia face challenges combining paid work and childcare responsibilities. This could be an additional cause for Serbia's low fertility rate, which is one of the lowest in European countries, and average in the region at 1.46 percent in 2014. The employment rate of women in Serbia (38.3%) is significantly lower than the EU-27 average (58.5%). Of all the employed in the transport sector in Serbia, 20 percent are female and 80 percent are male. Measured by the European Institute for Gender Equality (EIGE) Gender Equality Index, according to 2016 data, the value of Index for Serbia was 56, which was significantly behind the EU-28 average of 66.

The most prominent inequalities are in the domains of money, time and power, indicating lower economic standard of women, carrying out disproportionately unpaid household work and care for family, and insufficient participation in decision making in positions of political, economic and social power. The labour market participation is much lower for women than for men, as indicated by activity, employment, unemployment and inactivity rates. Vulnerability of women in particular when it comes to the share of ownership has been scoped in.

Vulnerable and disadvantaged groups, will be identified and their drivers of vulnerability scoped in, based on initial screening vulnerable groups, that could be affected by the Project include: retired, elderly and people with disabilities and chronical disease; single parent headed households, male and female; people with low literacy and ICT knowledge; economically marginalized and disadvantaged groups; persons living below the poverty line; women. Since the project location is not yet finally set the granular profile within detected vulnerable groups is not known at this moment.

Roma are one of the most vulnerable groups in Western Balkans, including the Republic of Serbia and are usually exposed to several risks and adverse impacts at once. The 2011 Census, has identified less than 150,000 Roma living in Serbia. Estimates of the actual number of Roma range between 300,000 and 600,000. Among the Roma, the so-called Ethnic mimicry, which makes it impossible to obtain relatively reliable data on the actual number of members of this ethnic group. The assumption is that Roma women use rail transport as the cheapest form of transport to neighbouring settlements in search of most often daily employment such as housework, cleaning services in companies, work in agriculture, etc.

Regarding labour and informal employment, the incidence of informal employment is the highest among the youngest age group (15-19 years), of whom 76% are employed informally. Incidence of informal employment tends to decrease with age. This can be accounted to the low level of professional experience of the youngest age group. Informal employment rates tend to rise again for older workers, with 50% of

employees over 55 being informally employed. Broken down by age group, young men and older women are over-represented in informal employment. The Labour Inspectorate reports that 52.375 informal employment cases have been confirmed following which a total of 45.207 was transformed to formal employment.

Recent labour market improvements have also benefited women, older workers, and the youth. Job creation was the strongest in services and industry. Earnings increased alongside the number of jobs, as real wages in the private sector grew by more than 6 percent in 2014–17 and by more than 4 percent in 2018. Despite recent labour market improvements, many people in Serbia are not working or searching for a job. The highest share of informally employed workers of the total number of workers is in the wider project area in South and East Serbia (27.7%). Of those informally employed the vast majority can be found in the agricultural sector (59.5% of all informally employed), followed by construction (7.1%). In other sectors, the share of informal work is less than 20%.

Environmental and social evaluation of options

This chapter presents the variants identified and analysed during 1st LoA stage.

Based on the characteristics of the project under analysis (multi-stakeholder, concept design phase, both quantitative and qualitative criteria) it was proposed to use a MCA (Multi criteria analysis) with weighting and allowing both quantitative and qualitative criteria.

MCA is an approach and a set of techniques, aiming at providing an overall ordering of options, from the most preferred to the least preferred one.

In summary, the steps of the MCA approach are six:

1. Establish the decision context and the aims.
2. Identify the options to be considered and compared.
3. Identify the investment objectives and constraints.
4. Identify the criteria that reflect the value associated with the outcome of each option and "weigh" their relative importance in the scope of the project.
5. Assess the impacts:
   - describe the expected performance of each option against the criteria and "score" the ability of each option for delivered impacts;
   - combine the weights and scores to derive an overall value for each option (total weighted scores) and rank them accordingly.
6. Conduct sensitivity analysis to assess the robustness of MCA results to changes in weights and scores.

The main objective of the project is to modernize the existing railway line in compliance with TEN-T standards, making it a reliable and competitive mode of transport and increasing passenger and freight traffic demand. Furthermore, the objective shall be achieved in a cost effective and sustainable way in compliance with strategic plans at national, regional and local level. It should comply with internationally agreed Technical Specifications for Interoperability and with the technical requirements for the core TEN-T.

In line with the above-stated objectives, the following main criteria are proposed:

1. Strategic relevance
2. Environmental aspects
3. Social aspects
4. Safety

5. Accessibility/Competitiveness
6. Technical aspects
7. Climate Change
8. Financial aspects

These groups of criteria correspond to the project objectives and reflect the nature of the project. The specific sub-criteria under each group were selected in anticipation of the results of the design elaboration of options after having been discussed with the stakeholders. The performance of the options against the criteria has been measured using proper indicators. These indicators can be qualitative or quantitative (monetized or other types of quantities).

Description of the options

The following options, were considered and evaluated with respect to the design speed per sub-section and single/double rail tracks, as it was decided among the stakeholders and documented in the Inception Report:

- **Option 1:** 120km/h-80km/h-120km/h single track
- **Option 2:** 120 km/h -120 km/h -120 km/h single track
- **Option 3:** 160 km/h -120 km/h -160 km/h single track
- **Option 4:** 160 km/h -160 km/h -160 km/h single track
- **Option 5:** 160 km/h -160 km/h -160 km/h double track

Vulnerability to climate change

The line passes through some identified sensitive to erosion and/or flood areas. The criterion for comparing the options was the length of the route through areas subject to flooding/soil erosion.

Environmental conditions in the alternative alignment areas

The rail line follows the South Morava River flowing generally from the South to North direction and crosses the river in several locations. River regulations will be necessary locally in the positions of bridges but also a long river regulation of more than 2 km is necessary in Options 1 and 2. Also, along the line there are several water sources and the line passes through the protection zone of the city water source for about 16 – 17 km, depending on the Option.

With respect to the effects of the Options on environment, it should be noted that none of the Options affects protected areas.

The Options present small differences with respect to the length of crossing green fields, from 21.33km in Option 5 to 28.06 km in Option 2. The potential effect on forest and/or wild vegetation areas also varies from Option 5 presenting less effect, mainly due to tunnels, to Option 2 which presents the max effect due to realignments in open tracks. This effect represents an estimate of the area of the belt of natural greenery (forests, hedges) that the railway line will cut i.e. it corresponds to potential severance.

Landscape and optical intrusion (due to high cuts or embankments) presents greater variations between Options, with Options 4 and 5 being more intrusive and Options 1 and 2 less intrusive.

Social aspects

Realignments will have different effect on the villages along the line. This effect could be beneficial in cases where the rail line is separating or very close to a village, while the realignment bypasses the urban area. The number of villages separated by rail or very close to the rail line, declines from 19 in Option 1 to 16 in Option 2 and to 15 in Options 3, 4 and 5.

Expropriation

In order to estimate the effect of the options, a corridor of 30 m width for the single track options and of 35m width for the two-track option has been reserved in accordance with the Spatial Plan of the infrastructure corridor Nis - Presevo. The areas of agricultural land to be expropriated under options are the smallest in Option 1, and the largest in Option 5.

The impact of alternative options on displacement was estimated based on the categorization of buildings into residential and industrial. For the estimation of the buildings to be demolished a few assumptions were done: for Options 1 to 4, where there is little or no deviation from the existing alignment, a belt for demolition of buildings of 15 m was adopted. For Option 5, this was raised to 19 m. For all options, on sections where the route deviates from the existing alignment, the belt in which the structures are demolished varies according to the height of the embankment or depth of the cut, as follows:

- cut/embankment up to 3m - belt width 17m (for option 5 belt width 21m)
- cut/embankment up to 6m - belt width 26m (for option 5 belt width 30m).

There will be no demolition on the sections where tunnels are planned.

Cultural heritage

Thirteen sites of cultural heritage have been identified along the corridor. One site is on Subsection A, near Grdelica, where Options 4 and 5 may pass under the site, in a tunnel. Two of the sites are further away from Options 3, 4 and 5 than they are from Options 1 and 2. Nine sites are along Subsection C, with little difference in the alignments on this subsection. Therefore, little difference between the options can be identified. Besides these objects, one graveyard has to be relocated in Subsection B of Option 5.

Scoring and selected option

Scoring of performances is expressed by a number in a 1 to 5 scale for all criteria.

Each option is evaluated for each criterion, according to the above mentioned indicators, and got a performance score in a 1 to 5 scale (higher score for the best option).

The evaluation of the Options was performed by a team of Senior Experts covering technical, environmental, social, traffic and transport planning expertise. In total Option 4 got the higher score. According to the evaluation performed, Option 1 presents higher performances in the financial criteria i.e. due to low construction and maintenance cost only. Option 2 is the least advantageous Option, presenting no top scoring in not one of the criteria. Option 3 presents higher scores in the social criteria,

while Option 4 in safety, accessibility/competitiveness and climate change. Option 5 presents higher performances in environment, safety, technical aspects, strategic relevance and climate change, but lower scores in the financial criteria.

In overall, Option 4 got the higher weighted score, Option 3 getting the second highest score. Option 1 follows in scoring.

MCA Sensitivity Analysis

The Sensitivity Analysis provides the result of the MCA assuming different weights were attributed to the criteria. This helps to measure how robust the MCA result is and will show if another option could be considered as optimal. In most cases Option 4 remains the optimum one. In the only case that Option 4 is not the best one, it is ranked second to Option 1. It should be noted, also, that according to the sensitivity results, the second best option varies between Option 3 and Option 5.

It was concluded after the First Level Options Analysis Report (May 2022), that the preferred option for consideration was a combination of Options 1 and 4 in that report, i.e. 160 km/h for Subsections A and C, and 80 km/h for Subsection B. Subsection B passes through the Grdelica gorge and would be very expensive to reconstruct for 160 km/h.

Key E&S impacts

Environmental impacts

Regarding environmental parameters, no red flags have been identified concerning the reconstruction and modernization of the railway line.

Landscape

For most of the length, the railway corridor follows the alignment of the existing railway. This reduces the magnitude of change and impact on surrounding receptors. In these locations, the Project is not expected to be at odds with the existing landscape character.

The construction phase will result in the demolition of a number of residential properties and other above ground structures, and the earthworks will result in a significant perceptual change to the landform within the affected area.

A more in depth assessment of the existing situation (baseline), analysing the existing landscape and visual amenity context of the receiving environment and human receptors will be carried out at the ESIA stage.

Air

A number of on-site construction activities will contribute to the increase of dust and PM10 such as site clearance and preparation.

In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to site access routes.

Across demolition, earthworks, and construction receptors sensitive to dust soiling and negative ecological effects additional risk. The Contractor will be required to apply the proposed guidance and control measures during construction, to avoid the risk of a significant air quality effect. With the application of the mitigation measures described in the ESMP of the ESIA, the generation of dust and PM10 during construction will not result in any significant air quality effect. Residual effects are considered to be negligible (not significant).

The primary effect of the Project during operation is expected to be modal shift of vehicles from road-based journeys to rail-based journeys, leading to a reduction in car, bus and Heavy-Duty Vehicles (HDVs) journeys and therefore emissions, particularly concerning PM10 and NO2 along local road links.

Specific numbers of vehicles and plant associated with the construction phase have not yet been determined. Therefore, a qualitative assessment of the impact of construction vehicles and plant on local air quality will be undertaken at the ESIA stage.

Climate change

The most dominant climate change impact in the wider area is floods, especially in the vicinity of the river Morava. Other climate change incidents will be temperature increase, precipitation decrease (in terms of frequency), precipitation increase (in terms of intensity) and fires.

The key steps of the ESIA for GHG emissions will be to quantify expected changes to GHGs in future years and to explore opportunities for mitigation in the Project design. The ESIA will assess material climate change resilience/adaptation issues and confirmation of climate adaptation measures considered, including the design of railway maintenance, e.g. structures, geotechnics, drainage, and provisions for dealing with extreme weather events (cold, heat, flooding).

Noise and vibration

Several settlements are and will be bisected, where with the appropriate mitigation measures (noise barriers, window facades), any impacts will be dealt with as in all such linear projects.

Construction activities inevitably lead to some degree of noise disturbance at locations near the construction activities. It is however a temporary source of noise.

Noise predictions will be undertaken for a study area of 300m either side of the railway to represent a typical daytime operation. Main core phases can be site preparation, earthworks, bridge construction and rail track construction. It is expected that once good practice measures are implemented the majority of activities will not give raise to significant effects.

Regarding vibration during construction, a desktop assessment will be undertaken in order to determine impacts along the route due to vibration levels arising during the construction phase. This involves assessing annoyance from human receptors and also damage to building structures.

Baseline noise and vibration levels are going to be measured and integrated into the models and impact assessment.

For the estimation of the noise impacts during operation, noise modelling will be carried out, while sensitive receptors will be identified. For the noise modelling, the CadnaA (Computer Aided Noise Abatement) software will be used. The most important source of operational vibration are wheel and rail vibrations induced during contact when trains are passing. Finally, re-radiated noise refers to noise that is experienced within a building due to radiation from vibration building elements (e.g. floors, walls and ceilings). Levels will be calculated for passenger and freight services. The ESIA will assess the potential noise and vibration impacts from both the construction and operational phases of the Project.

Waste

The ESIA will assess the potential impacts from waste and wastewater generation during construction. The assessment of impacts will be based mainly on the consumption of material resources (from primary, recycled or secondary, and renewable sources, and including products offering sustainability benefits) including the generation and use of arising's recovered during construction phase of the Project and the generation of waste from the construction phase of the Project.

The waste generated during the construction phase will primarily include waste ballast, sleepers, rails, and track fittings. The contractor, with the SRI consent, will prepare a Waste Management Plan to handle this waste. The waste that will be generated during the operation of the planned railway will primarily originate from passengers who will use the stations on the railway: municipal waste, paper and packaging waste.

Waste from the maintenance of the rolling stock, from the maintenance of the railway and the accompanying infrastructure can be expected along the route of the railway. The quantities of this waste will depend on the maintenance activities.

The intensity of these impacts will also be scoped in.

Geology and Soils

At this project stage, there are no data that can assist in the accurate assessment of impacts, while a preliminary justification of impacts is presented below.

Potential impacts on topsoil maybe provoked from the Leaks/Spills from HGVs, Machinery and Hazardous material storage. Accelerated degradation may lead to a reduction in the quality of topsoil. The construction activities will be limited in time and physical extent and therefore the soil function in the area of project will not be altered. The tracks on these sections would need to be dismantled, and the land may need to be decontaminated.

The groundcover surrounding the project alignment is generally comprised of covered agricultural land, with residential areas. The extent of topsoil fertility has to be assessed. The construction phase of the project will be limited in time and physical extent. Regarding areas that will be temporarily used for construction, these can be restored to agricultural use.

The limited time and scope of construction activities, as well as good implementation of measures can result in an impact of insignificant magnitude.

In the exploitation phase, possible impacts on the quality of the upper layer of soil and soil erosion, which with the implementation of mitigation measures can be insignificant.

The ESIA will assess the potential impact on land and geology based on soil and topographic data, data from existing published sources and geotechnical and soil investigations undertaken as part of the project. According to existing data, erosion is weak.

Further investigation of potentially contaminated locations along the railway will be conducted during the preparation of ESIA. In the event of dismantling the existing railway (at locations where the new route deviates from the existing one) and reusing the land for agricultural or sports and recreational purposes, it is necessary first to examine the soil quality to determine the potential level of contamination and then carry out soil decontamination if required.

Waters

Pollution risk to surface water bodies from increased sedimentation and spillages is a possible impact that may derive from land clearance, excavation, dewatering of excavations, tunnelling, construction of earth embankments and construction materials such as aggregate and stockpiles of topsoil. Temporary increased sedimentation within watercourses is also likely to occur as a result of the construction of bridge piers with the watercourse channel. Runoff with high sediment load may have adverse impacts on adjacent water bodies through increasing turbidity and by smothering vegetation and be substrates.

Increased pollution risks from the discharge or spillage of fuels or other harmful substances associated with temporary works may also migrate to local surface water receptors. Currently, only the quality of the main river, Juzna Morava is known, while the quality of smaller rivers and streams is not known. Surface water measurements are needed to be carried out at the ESIA so the magnitude and significance of this impact can be estimated.

The ESIA will focus on the potential impacts of the Subproject's activities on water quality for the key receptor, the Juzna Morava River and their tributaries both during construction and operation.

The study area for surface water characterization and assessment is defined according to potential receptors that maybe affected by the Subproject and the surface water catchment within which the Subproject is located. The study area typically encompasses surface water features up to 0.5km from the Subproject that have the potential to be affected directly by the proposed works.

Biodiversity

The ESIA will assess the potential impacts of the Subproject's construction and operation activities on habitats, fauna and flora in the study area. The ESIA will pay utmost care in assessing the project Biodiversity impact.

The baseline will provide a description of the habitats and fauna baseline and the wider ecological study area. The Area of Influence may extend up to a precautionary maximum distance of 500m of either side of the project centreline (this could be less, i.e. 200m either side in areas where the existing line will be rehabilitated or

constructed, while 500m in areas where some valuable habitats maybe exist), within which a level of acoustic impact will be experienced during construction and operation of the Subproject. This zone will be used to inform the scope of receptors requiring consideration through the assessment process (i.e. those potentially impacted) as well as providing the basis for predicting likely impact magnitudes.

All target species surveys will be undertaken in accordance with best practice survey guidance. The findings of the survey work will be analysed and presented in the ESIA chapters. Consistent with requirements of the EU Habitats Directive and Birds Directive, the assessment will also verify any natural protection areas that could be affected by the Subproject. Depending on the outcome of the assessment, there may also be a requirement to develop a specific Biodiversity Action Plan as a key mitigation strategy.

Social impacts

Within the social changes and broader social impacts groups no imminent early substantial unmanageable risk signs i.e., red flag cases have been identified towards the future development phases of the Subproject. The major concern is the impact stemming from involuntary land acquisition and resettlement, in particular at offline sections. However, since the alignment will be kept as much as possible on the existing route, physical displacement impacts should be minimised.

The adverse impacts have been observed against the below social receptors:

Community health and safety risk

Community health and Safety risk have been scoped in as risks during construction, reconstruction and operation. It is assessed that risks are constrained to the usual types of risks in similar projects - such as disruption of traffic and pedestrian routes, noise and vibration from equipment, spills /releases, direct mortality – e.g. as a result of increased collision risk with the railway and electrocution power lines, and other on and off-site risks. Given the scale of the Subproject and the reliance on vehicles to access the route, vehicle and road safety was identified as one of the biggest health and safety risks.

Labour and OHS risks

The OHS risks associated with the activities are usual types of risks i.e. from working at heights, risk from working with electrical circuits, Risk from operation of machinery and equipment, inadequate resources, equipment, procedures, training. Also, construction works on the rail while the regular lines are operating poses significant impact. The ESIA and subsequent management plans will need to discuss and agree with the SRI in details the mitigation measures for construction works in the area of OHS. In the context of the COVID- 19 outbreak, basic infection prevention measures can help the containment of the spread of the disease and protect the workers and the public but also develop response plans to cover minimising the virus spread. One of the prominent risks in the construction sector as also highlighted in the baseline section is the risk from shadowed and informal Labour. Risk from child and force labour is negligent given the country and project context.

Land acquisition and involuntary resettlement

The most prominent impacts relate to the impacts from land acquisition and involuntary resettlement, loss of access to assets and loss of livelihood. The complexity of displacement has been duly appreciated and assessed through the option analysis. These impacts are scoped in and remedy carefully analysed, planned and delivered as it may negatively affect the economic and social well-being of affected people and provoke severe economic and social problems in the origin communities. Subproject-induced involuntary resettlement shall be minimised by analysing alternative project designs and locations.

However, total avoidance is not feasible and therefore the following impacts are anticipated: Physical and economic displacement and land restrictions, Damages to property and assets, Loss of private and public lands Loss of business lands Temporary land allocation, Damage to land and property impacts and Loss of livelihood. Fragmentation of agricultural land is seen as a significant residual impact based on past large scale infrastructure development projects in Serbia.

Avoidance of highly sensitive densely populated areas are without compromising the health, safety and well-being of affected people. Unavoidable impacts shall be mitigated by implementation of the Resettlement Action Plan (RAP) developed in parallel as a separate social management instrument for the project.

A detailed socio-economic baseline assessment on people affected by the project, including impacts related to land acquisition and restrictions on land use will be part of the project activities focused on the development of Feasibility and ESIA Phase when the Preliminary Design is developed to the higher level of details.

Transboundary Impacts

Potential transboundary environmental impacts are likely to occur at the area of the railway alignment near the North Macedonian border, and these could include impacts to surface water, groundwater, fauna and protected and designated areas.

Potential transboundary social impacts are expected to occur along the railway alignment not only near the North Macedonian border but wider.

The most important transboundary impacts potentially will be the impact on economy and Communities Quality of life.

Stakeholder engagement

Operations and activities for which potential financing from the European Investment Bank (EIB) is sought fall under the application of their respective applicable Environmental and Social Standards. The EIB Environmental and Social Standards (2022) provide an operational translation of the policies and principles contained in the 2009 EIB Statement of Environmental and Social Principles and Standards and are grouped across 11 thematic areas covering the full scope of environmental, climate and social impacts and issues. In response to the commitment to comply with EIB SEP has been developed as an essential component in project planning, implementation and operation.

The SEP will be developed and is part of an iterative process in communicating with stakeholders who may be affected by or might be interested in the Subproject throughout its life cycle. To allow uptake of Stakeholders concerns, grievances but also positive feedback during all of the Subproject stages a fully functional system introduced by the promoter that affords all stakeholders, in particular impacted individuals and communities, the ability to provide feedback, channel their concerns and, thereby, access information and, where relevant, seek recourse and remedy. The scope of such a mechanism concerns the entire operation, yet it is not intended to serve employer-workforce relations, as a separate grievance structure relevant to workplace grievances is exclusively dedicated to this purpose.

The specific nature of the Subproject requires a broad engagement with various project stakeholders with main discussions between sector specific institutional Stakeholders.